sufferers from cholera among the poorest and most destitute class. The existing hospitals, even if the authorities should consent to the admission of persons ill of cholera, could not furnish the requisite accommodation, unless they were shut against persons labouring under other severe diseases—a measure which, at the approach of winter especially, would add much to the distress of the poor.

6th. In conclusion, the Committee would urge on the rich, who have comparatively little to fear for themselves, the great duty of generously and actively ministering to the relief of the poor, while the epidemic prevails; bearing in mind that fuel, and warm clothing, and sufficient nourishment, are powerful safeguards against the disease.

They deem it most desirable that the parish authorities should at once improve the diet, and increase the comforts, of the poor under their charge; and that the wealthy should form societies for the supply of food, clothing, and fuel, to those who, though not paupers, still need charitable assistance in the present emergency.

Such measures, which it is the duty of those possessed of power and wealth to adopt, would, the Committee believe, if liberally carried out, deprive the cholera of half its victims.

John Ayrton Paris, President.
Francis Hawkins, Registrar.

College of Physicians, Oct. 28, 1848.

Prov. Med. and Surg. Journal, Nov. 15.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

91. *Researches on the Principal Metallic Poisons, and Mode of Ascertaining their Presence.* By M. Abrue. (Read to the French Academy, &c.)—It often happens that persons called upon to make toxicological examinations of substances entrusted to their care, regret the absence of a positive and unique method to serve as a guide when they are entirely without any indication as to the direction which should be given to their research.

Indeed, the treatises on toxicology which, in other respects, afford so much valuable information on the research after poisons, often leave the reader in a state of the most serious embarrassment, in proposing to him for each poison various processes, differing very much in value, and of a very dissimilar kind.

Hence arises a grave inconvenience. The investigator who wishes to ascertain with accuracy the presence of a poison in the suspected matter under investigation, finds it necessary to make so many experiments before he can in any way arrive at the probable nature of the poison for which he is searching.

This void we here endeavoured to fill as far as concerns the principal metallic poisons, and to bring the medico-chemical operations to the point of a single problem of analytical chemistry:—*One or more metals being given in the contents of an organic matter to determine their nature.*

To arrive at a solution of this important problem, we have passed successively in review the different well-known methods which up to the present time have been proposed for the special research of each metal.

Struck with the distinctness of the results obtained in the research after antimony, by the process of M. Millon, which consists, as is well known, in destroying the organic matter by the combined action of hydrochloric acid and chlorate of potash, we have conceived the idea of drawing up the basis of a general method, and have arrived at a modification of this process in such a manner, as not only to extend it to the research after all the principal poisons, but still more completely to disembarrass us of the organic matter.

This method comprehends the compounds of the following metals:—

Arsenic
Antimony
Mercury
Copper
Lead
Tin
Zinc
Silver.

The operation will be as follows:—

Analysis of the solid matters found in the stomach, the matters vomited, and of the *stools, the tissues of the gastro-intestinal canal, the liver, and other organs, or any other suspected solid matter, the blood, the urine, and other organic liquids, previously concentrated at a gentle heat.*

The investigator should first attentively examine by the naked eye, or better still, by a glass, the substances passed in the vomits and the stools, the matters found in the digestive canal, and the mucous surface of the same canal. He may thus in some cases furnish himself with valuable indications, which will put him in the way of research, and it is possible, as is sometimes the case, that he may find in the digestive canal, and particularly in the folds of the mucous membrane, solid particles of the poisonous substance.

In this last case, he must carefully remove, by means of a small pencil, the particles of poison, and hasten to examine them by the ordinary methods; but supposing that no important indication results from this physical examination, he must proceed as follows in the research of the poisons comprised in the above table.

With very clean scissors dividing the suspected matter into very small portions, take a given weight, which should never be less than two hundred grammes (about seven ozs.), and introduce it into a glass flask, with one half its weight of pure and smoking hydrochloric acid. At the neck of the flask is to be adapted a cork, perforated with two holes, of which the one is destined to receive a tube of fifty-five to sixty centimetres (twenty inches) in length, and one centimetre (three-eighths of an inch) in interior diameter, dipping an inch in hydrochloric acid. From the other opening arises a tube bent back at a right angle, of which the second vertical branch plunges through a cork into distilled water contained in a receiver. The cork of this is furnished with a second hole destined to receive a straight tube which will not plunge into water.

Things being thus arranged, the flask is placed on a sand-bath, and the receiver in cold water changed from time to time; the sand-bath is maintained at a temperature near the boiling point of the liquid, without reaching that point, during at least four hours, agitating the contents of the flask from time to time.

The fragments of organic matter gradually dissolve in the hydrochloric acid, and at length form with it a dense, homogeneous, and more or less dark liquid. Remove the sand-bath, and place the flask on the naked fire, and boil the liquid during two or three minutes. This done, commence to introduce by little and little crystals of chlorate of potash by the larger tube (taking care to agitate the flask continually), until about sixteen to eighteen grammes have been added for each one hundred grammes of the suspected matter under examination.

A vivid reaction and abundant disengagement of chlorine gas takes place; the liquid gradually clears, and at last becomes completely limpid and of a yellow colour, the intensity of which, varying much in its shades of colour, appears to depend especially on the great excess of chlorine which remains in solution, and not only the liquid in the flask, but the water in the receiver exhibit in a high degree the characteristic odour of chlorine. Small fragments of carbonaceous matter and of a resinoid substance float on the surface of the liquid in the flask, which are less abundant in researches on the blood, and is very abundant when the operations are conducted on the liver and other parenchymatous organs.

Allow the apparatus to cool, filter the liquor in the flask and mix with the water in the receiver, and that which has served for several washings, the residuum which remains in the filter. Pass a current of well washed sulphuretted hydrogen through the liquid for some time, and allow it to remain until the next day in a closed bottle. In every case there will be formed a precipitate more or less abundant in which should be sought for all the metals comprised in our table, except silver and zinc. The precipitate may nevertheless contain only sulphur and a small quantity of organic matter, which may be got rid of in the following manner:—Throw the precipitate on a filter without folds, wash with distilled water, and put it into a small flask with its weight of pure and fuming hydrochloric acid; boil, and add a few crystals of chlorate of potash. When the reaction is over add a small quantity of distilled water, and apply heat with much precaution to drive off all the free chlorine. Filter again, and thus a limpid, scarcely yellow-coloured liquid will be obtained. It is in this liquid that arsenic, antimony, mercury, copper, lead, and tin is to be found, if the suspected matter contain either of these substances. As to the zinc, as it is not precipitable by sulphuretted hydrogen from an acid liquor, this metal must be sought for in the liquid obtained by filtration after the action of sulphuretted hydrogen. As silver can only be found in an insoluble state, it must be sought for in the residue of the first filtration.

After having thus described our process, we pass to the examination of the most sensible methods for ascertaining the presence of the different metals contained in the above table, endeavouring to avoid all the causes of error which are likely to arise. In the liquid obtained in the last place, we search simultaneously for arsenic and antimony by means of Marsh's apparatus, as modified by the Academy of Sciences: we then pass to the research after mercury, copper, lead, and tin, in the liquid contained in the apparatus, after having dissolved in *aqua regia* all that is deposited at the bottom of the bottle. As for zinc and silver, the first must be sought for in the liquid obtained by filtration after treatment with sulphuretted hydrogen; and the second in the residue of the first filtration. We have often operated on two milligrammes (1-38th of a grain) mixed with considerable quantities of animal matters.—*Dublin Med. Press*, Oct. 18, from *Pharmaceutical Journal.*

92. *Case of Poisoning by Arsenic, in which the symptoms were unusually delayed.*—Walter Clegg, Esq., reports (*Lancet*, Nov. 4, 1848) the following remarkable case of this character.

"On Sunday, August 27th, at five o'clock in the afternoon, a woman requested me to visit her niece, who had, about noon, taken a teaspoonful of white arsenic. I attended, and found a heavy, stupid looking girl sitting in her chair, more asleep than awake. On rousing her, she reeled about the room as if intoxicated; indeed, I suspected poisoning by some narcotic. But she acknowledged having swallowed 'white mercury,' and a paper packet was brought to me, from which she had taken the poison, containing about ten grains of a white powder. By means of my pocket-lens, I immediately recognized this powder to be arsenious acid. She vomited once after dinner, but there were no further symptoms until half an hour before she died—that is, at noon the following day.

"She had no sickness, no pain, no acrid eructations, no burning taste in the mouth; her face was very pale, and she was faint and giddy. The sulphate of zinc, with mucilaginous drinks, soon produced profuse vomiting, and this was kept up for half an hour. Then another medical man arrived with a jar of the hydrated peroxide of iron; and having some pressing professional engagements, I left her with my friend, who administered large doses of the antidote.

"At nine o'clock at night we visited her together. She had experienced no pain; no unpleasant symptom whatever; she was disposed to sleep quietly. At ten o'clock the next morning the patient's aunt came to say that her niece was quite well, 'might she go a gleaning?' Up to half past eleven o'clock she continued more than ordinarily cheerful, and was busied in preparing the family dinner. At half past eleven o'clock she suddenly complained of an excruciating pain in the body, with excessive prostration of strength. She went to her bedroom to lie down, and at twelve o'clock was found dead, kneeling by the bedside. Thus she died in about eighteen hours after taking the poison, and within half an hour after the first decided symptom of poisoning was manifested.

"*Autopsy, forty-eight hours afterwards.*—The stomach contained half a pint of a thin, dirty green fluid; the mucous coat was much corrugated, having a fungoid appearance, very soft, and so fragile that a touch of the finger tore it away. Three or four large reddish-brown patches were observed, and these extended into the intestine considerably beyond the duodenum. The peritonæal coats of the stomach and bowels were not inflamed; the lungs and the heart were healthy; the head was not inspected.

"It only remains for me to add that the matter vomited, and the fluids in the stomach and intestines, contained abundant evidence of the presence of arsenic. Minute fragments of a white powder were seen adhering to the mucous coat of the stomach, and these, by the ordinary tests, were proved most satisfactorily to be arsenious acid.

"*Explanation* (?)—The lower classes in Lincolnshire are very much addicted to the use of opium and laudanum. I have known women with three shillings a